

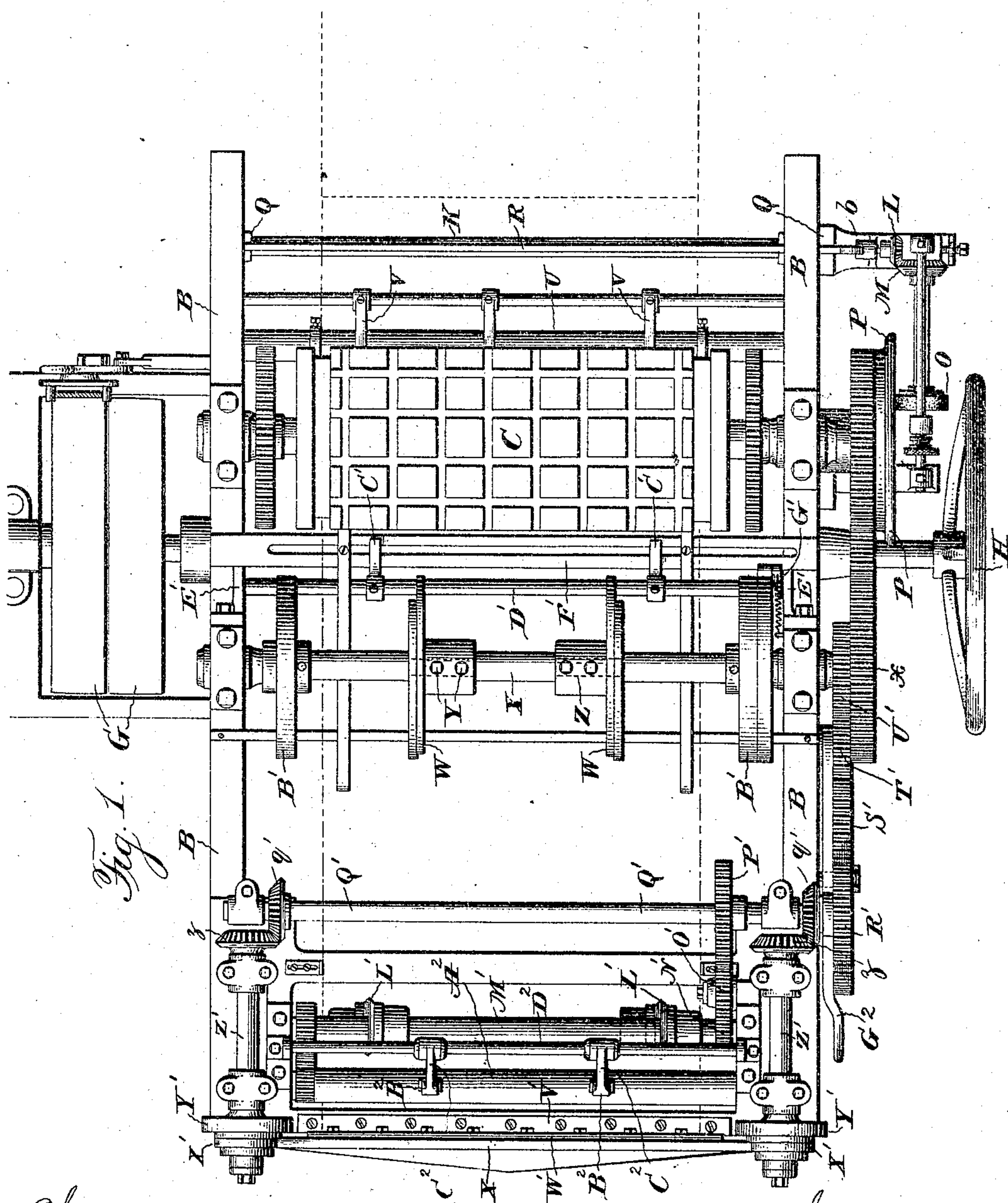
No. 782,356.

PATENTED FEB. 14, 1905.

C. H. PALMER & J. W. DENMEAD.
PRINTING PRESS.

APPLICATION FILED JAN. 9, 1900.

6 SHEETS—SHEET 1.



Witnesses:
Jas. C. Hutchinson.
Henry C. Hazard

Inventors.
Charles H. Palmer and John W. Denmead, by
Prindle & Russell, their Attys

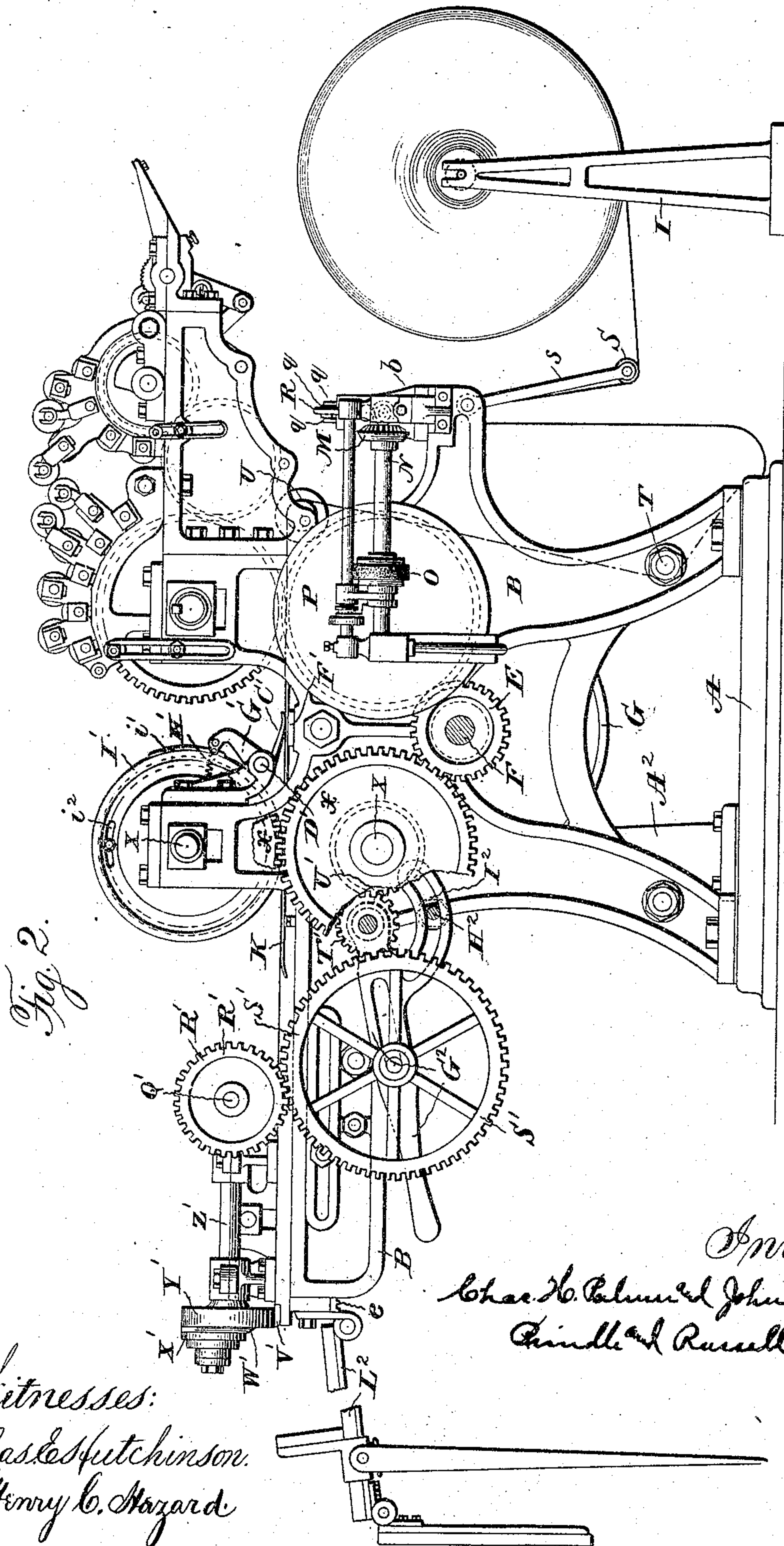
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6 SHEETS—SHEET 2.



Witnesses:
Jas. Hutchinson.
Henry C. Hazard

Inventors.
Chas. H. Palmer & John W. Denmead by
Chas. H. Russell, their Attys

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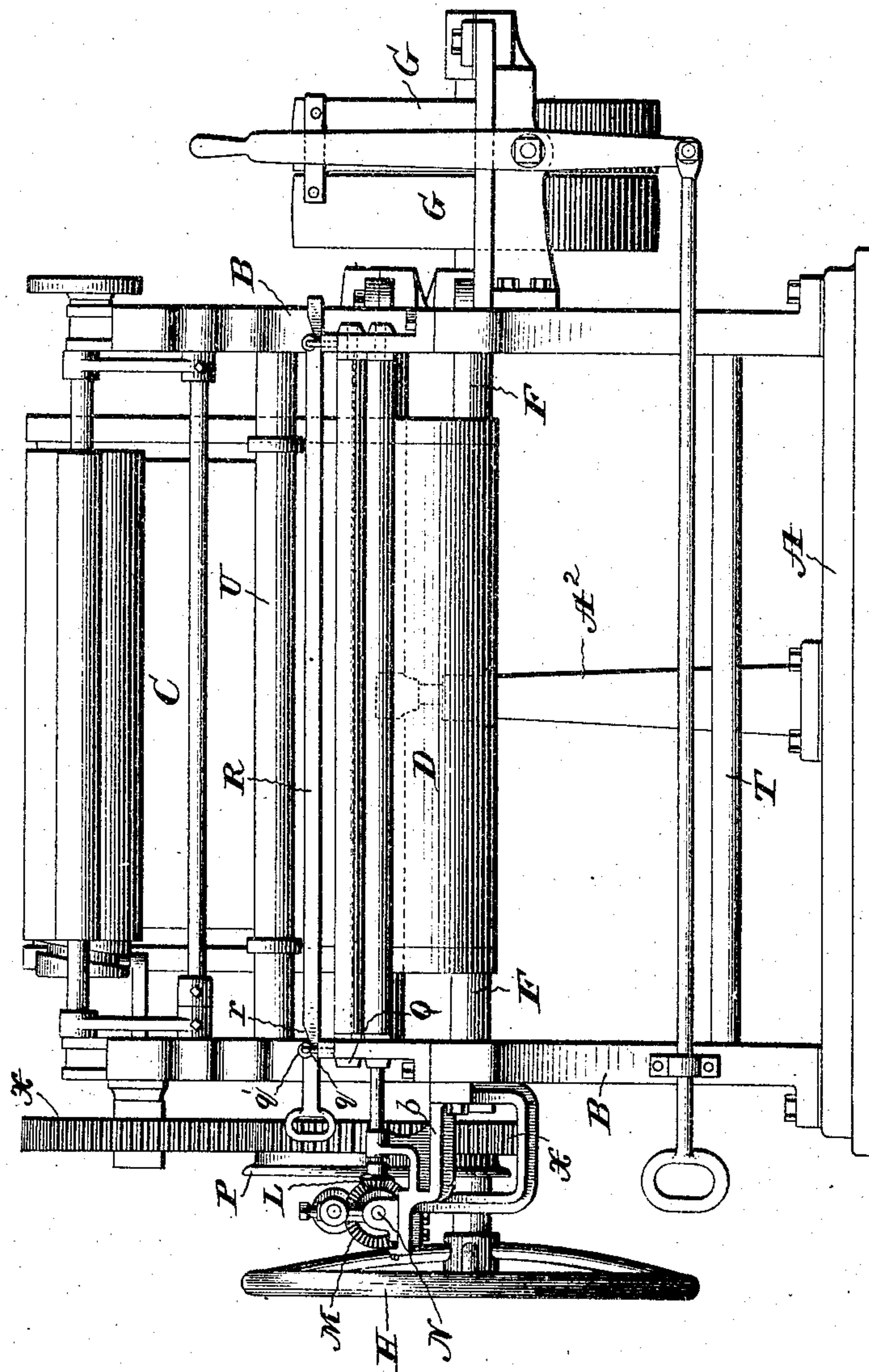
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6 SHEETS—SHEET 3.

Fig. 3.



Witnesses:

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Henry C. Hazard

Inventors.

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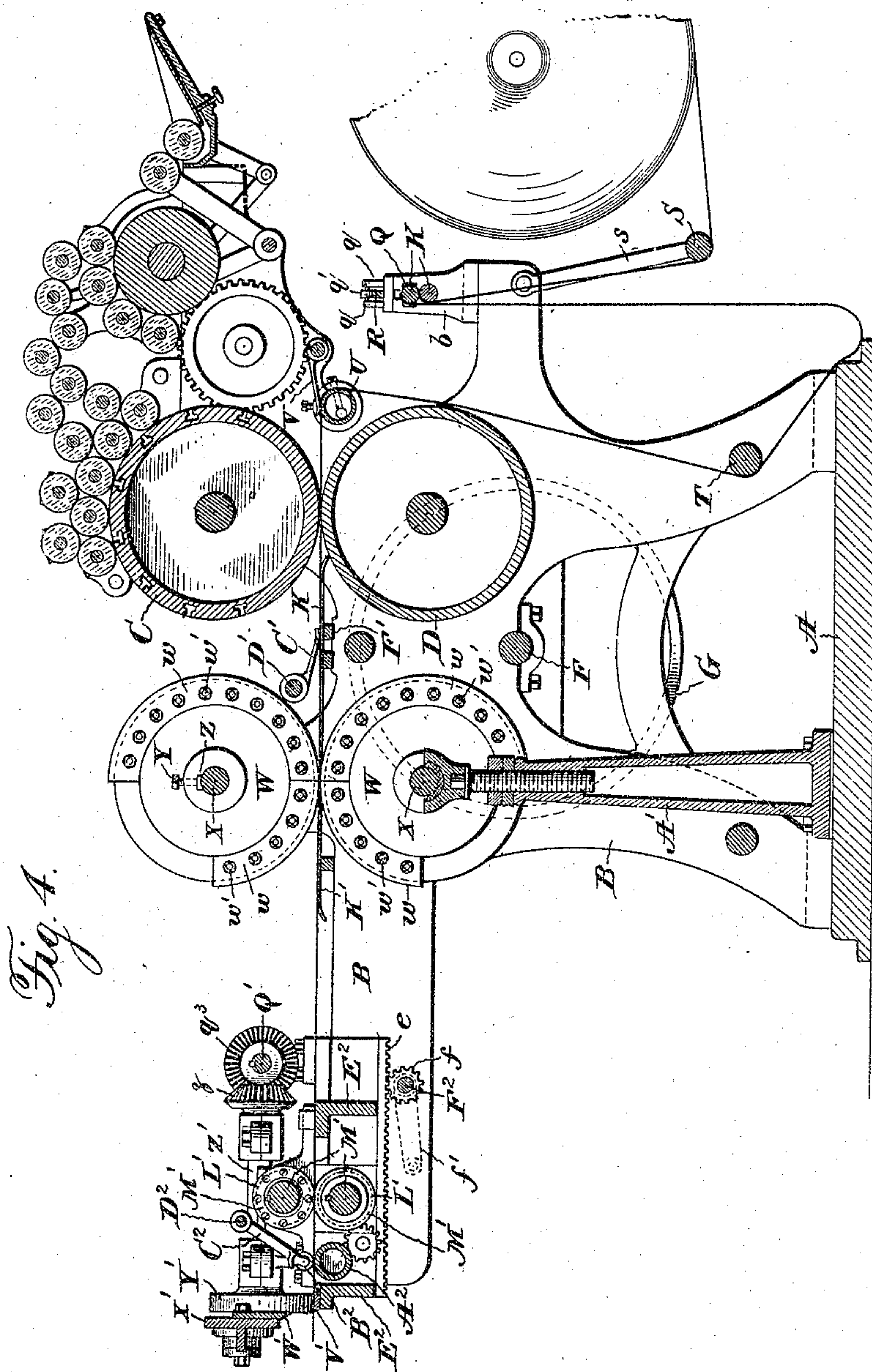


Fig. 4.

Witnesses:

Jas. C. Hutchinson.
Henry C. Hazard.

Inventors.

Chas. H. Palmer and John W. Denmead, by
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6 SHEETS—SHEET 5.

Fig. 5.

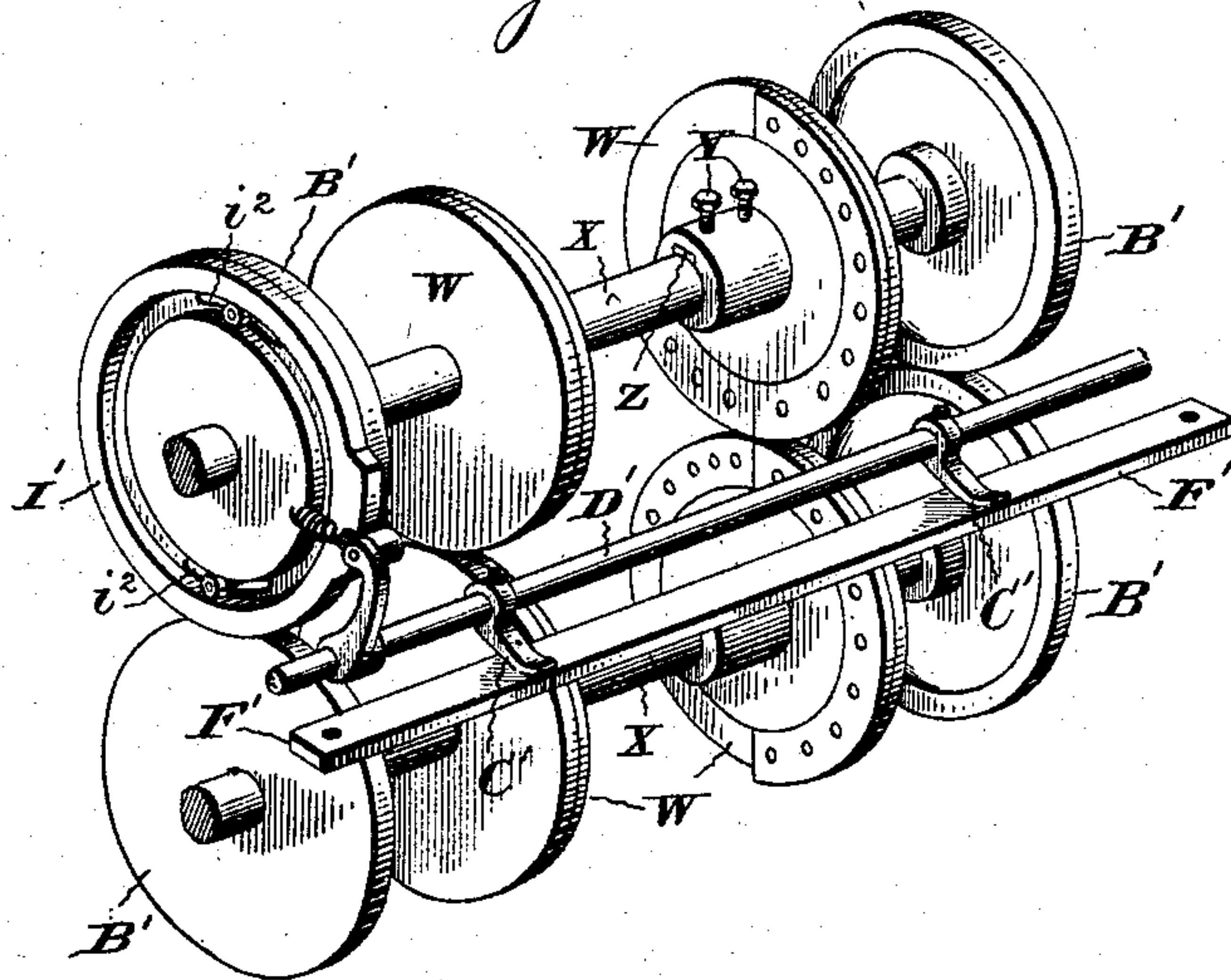
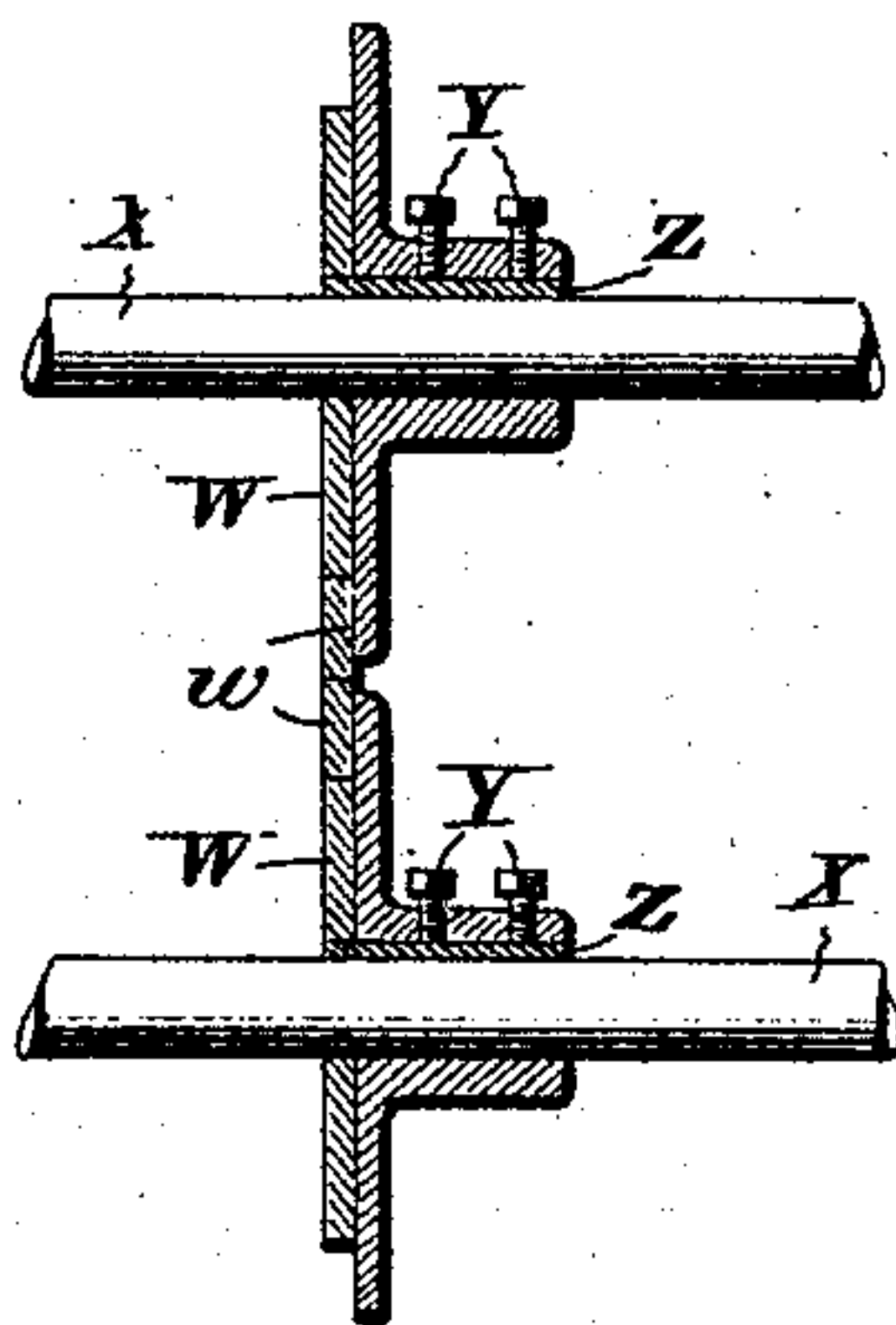


Fig. 6.



Witnesses:

James Hutchinson.
Henry C. Hazard

Inventors.

Chas. H. Palmer & John W. Denmead, by
Charles E. Russell, their Attys

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6 SHEETS—SHEET 6.

Fig 7.

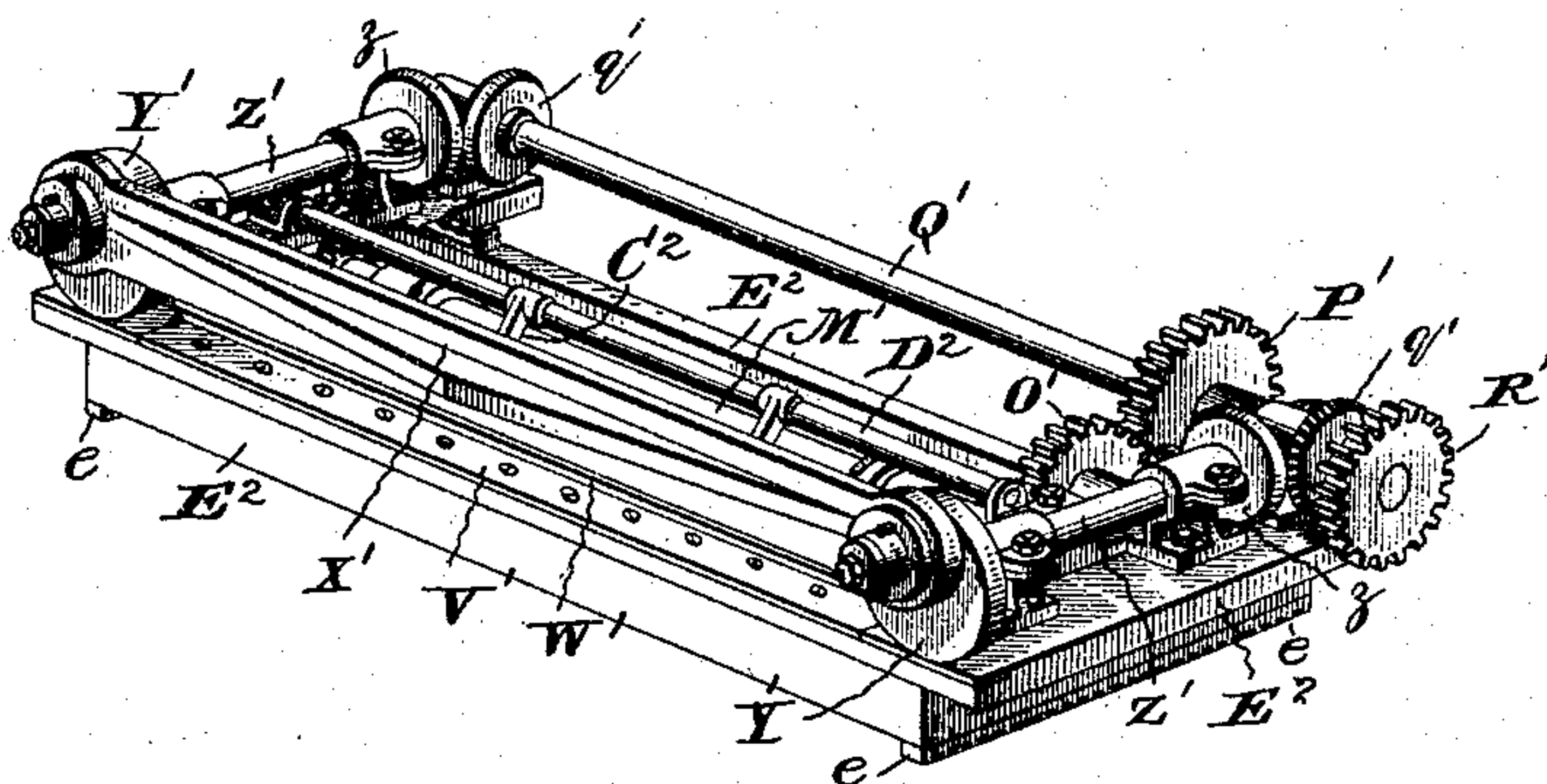
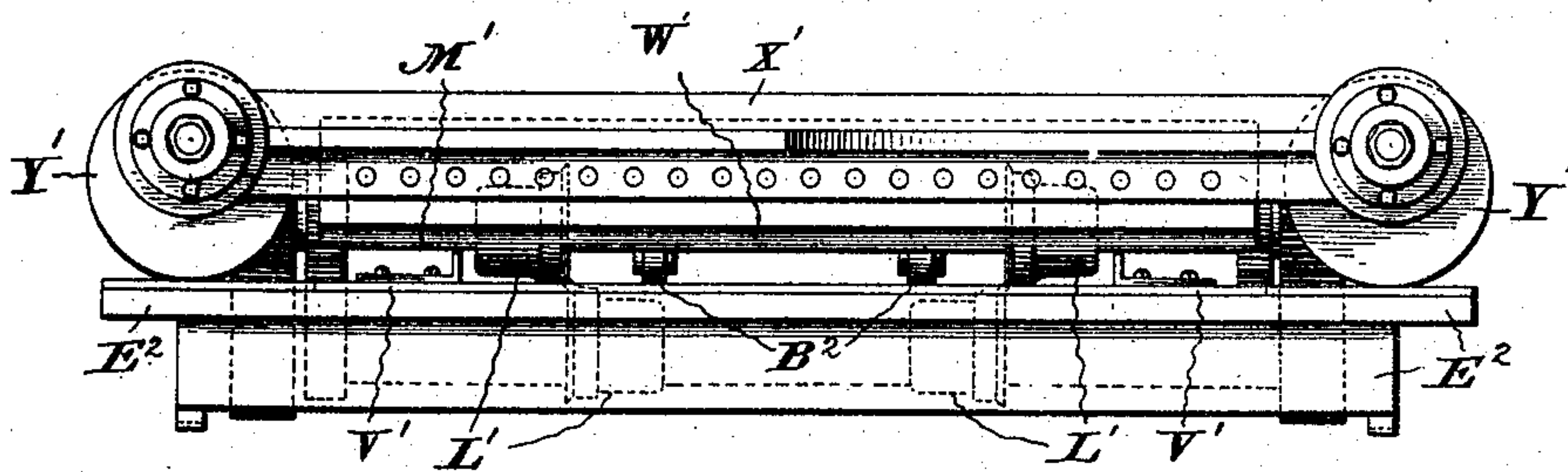


Fig. 8.



Witnesses:

Jas. E. Hutchinson.
Henry C. Hazard.

Inventors.

Chas. H. Palmer & John W. Denmead, by
Frederick Russell, their atty.

UNITED STATES PATENT OFFICE.

CHARLES HENRY PALMER AND JOHN W. DENMEAD, OF AKRON, OHIO,
ASSIGNORS TO THE DIAMOND MATCH COMPANY, OF NEW YORK,
N. Y., A CORPORATION OF ILLINOIS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 782,356, dated February 14, 1905.

Application filed January 9, 1900. Serial No. 881.

To all whom it may concern:

Be it known that we, CHARLES HENRY PALMER and JOHN W. DENMEAD, of Akron, in the county of Summit, and in the State of Ohio, have invented certain new and useful Improvements in Printing-Presses; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of a rotary printing-press embodying our invention, the inking mechanism not being shown. Fig. 2 is a side elevation of said press; Fig. 3, an end elevation thereof; Fig. 4, a longitudinal section of the press; Fig. 5, a detail view in perspective of the intermittent paper-feeding and the paper-stopping mechanism; Fig. 6, a detail view in section of the paper-feeding mechanism; Fig. 7, a detail view in perspective of the paper-cutting mechanism shown detached from the press, and Fig. 8 an end elevation of said mechanism.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to provide a web-printing press adaptable to considerable range of work in respect to the size of the matter printed and capable of rapid and perfect work; and to these ends said invention consists in the press having the features of construction substantially as hereinafter specified.

We have selected as the most satisfactory embodiment of our invention a rotary press, and in such embodiment we employ a supporting structure which, generally described, comprises a base or bed A and two side frames B and B, bolted to the bed. Mounted between the side frames and journaled in suitable bearings thereon are a type or form cylinder C and an impression-cylinder D, the former being directly over the latter. The form-cylinder is provided with numerous longitudinal and circumferential grooves, which enable forms of various sizes to be fastened thereto, so that at different times the press may be used to print matter of various sizes. Ink may be supplied to the form-cylinder in the

usual manner, and therefore no description of the inking mechanism need be given. The shafts of the two cylinders C and D are geared together, and the gear-wheel on the lower shaft meshes with and receives motion from a pinion E on the main shaft F, said shaft F having at one end proper fast and loose pulleys G and G and at the other end a hand-wheel H, the latter being furnished for starting the press.

Paper to be printed is supplied from a roll mounted, as is common, on a stand I, being drawn from the roll by a pair of feed-rollers K and K, journaled one above the other in bearings in brackets *b* and *b*, bolted to the side frames B and B, the lower roller being driven by gearing comprising a bevel-pinion L, connected therewith, which meshes with a like gear M on a shaft N, having a friction-wheel O, which engages a friction-disk P on the impression-cylinder shaft. The friction-wheel O is adjustable along the shaft N in a familiar manner to permit its speed to be varied so as to regulate the feed of paper by the feed-rollers. The upper feed-roller is journaled in boxes Q and Q, that are vertically movable in slots in the brackets *b* and *b*, so that for stopping the feed of paper or for other purposes said upper roller may be raised to remove pressure from the paper passing between the two rollers. As a convenient means for raising and lowering the upper roller there is attached to each of its journal-boxes Q an arm *q*, on which is a roller *q'*, between which and the tops of the brackets *b* and *b* is a horizontal bar R, having adjacent to each roller *q'* a depression *r* with an inclined surface. By moving the bar R longitudinally the depressions may be placed beneath the rollers *q'* and *q'* and thus the upper roller allowed to descend and bear upon the paper passing over the lower roller, or the depressions may be moved from beneath the rollers *q'* and *q'*, causing by the inclined surfaces the lifting of the boxes Q and Q and the roller journaled thereby. Before passing to the rollers K and K the paper is carried first beneath a roller S, that is suspended by bars *s* and *s* at each end, which are hinged or pivoted at their upper ends to the side frames B

and B. The paper thus passes from the roll on the stand I first to the roller S, thence upward to the lower roller K and between it and the upper roller K, next partially around the latter and downward nearly to the floor, thence over a round cross-bar T, that extends between the two side frames B and B, and then up to and over a round bar U, whence it passes between the two cylinders C and D.

10 The bar U is eccentrically pivoted at each end, so that by turning it on its pivots it may be raised or lowered to suit the level of the paper passing from it to the two cylinders. Fingers V and V hold the paper against the

15 bar U.

Located so as to engage the paper after having been printed is a feed mechanism whose feeding operations are intermittent. Such mechanism comprises a number (preferably two) of pairs or sets of wheels or disks W and W, the members of a pair being respectively mounted on parallel horizontal shafts X and X, that are journaled in bearings on the side frames B and B, one shaft being directly above the other. The periphery or circumference of each disk is not of uniform diameter throughout, but a portion is of reduced diameter, so that it results that the latter does not touch the paper, and therefore the paper is not fed thereby. As the paper is fed only when it is simultaneously engaged by the opposing portions of the disks of greater diameter, it is apparent that by adjusting the disks of a pair so that more or less of their circumferences of greater diameter can simultaneously engage the paper the amount of paper fed can be varied. One or both disks of a pair are therefore adjustable rotatively upon their respective shafts, so as to permit variation in the relative positions of their circumferences, each disk for this purpose being provided with a hub through which pass, preferably, two set-screws Y and Y, that engage a bar or strip Z, placed in a longitudinal groove in the hub and bearing against the surface of the shaft, against which it is pressed by the screws to lock or hold the disk in the desired position. In addition to the adjustability thus arranged for there is provision for further adjustment by forming the working or paper-engaging portion of the disk of several sections or segments w and w , that are removably attached to the disk by bolts or screws w' and w' . By increasing or diminishing the number of segments the working circumference may be respectively enlarged or reduced.

The feed-disk shafts are geared together by intermeshing gear-wheels x and x on the respective shafts, and power to drive them is taken from the main shaft by meshing the lower wheel x with the main-shaft pinion E. The lower shaft X is supported intermediate its ends, preferably at mid-length, by a standard A', which rises from the base or bed A and has a box or bearing at its upper end, through

which said shaft passes, and the upper shaft X is supported from the lower by two pairs or sets of disks or wheels B' and B', the two members of which are mounted on the respective shafts and have such diameter that their peripheries touch and roll upon one another. The disks or wheels B' and B' are of course placed upon the shafts at points beyond the edges of the widest paper used in the press, so as not to interfere with the paper. By supporting the feed-shafts as described they are maintained in proper relation, derangement of the feed-disks by sagging, due to wear or other causes, being prevented.

Owing to the momentum of the paper in passing through the press, it continues its movement after the feeding action of the disks W and W has ceased, unless means be provided to arrest its movement as soon as such feeding action ceases. Such an arresting means is accordingly provided and comprises an automatically-acting clamp device that temporarily grips the paper. In its preferred form said device consists of several fingers C' and C' on a rock-shaft D', placed between the printing and intermittent feeding mechanisms, the shaft being supported parallel with the feed-shafts X and X by and journaled in brackets E' and E', bolted to the respective frame sides B and B. Extending crosswise between the latter and beneath the free ends of the fingers C' and C' is a bar F', against which the paper may be pressed by the fingers, and thus held stationary. Near one end of the rock-shaft is a radial arm G', the free end of which is yieldingly held by a spring H' against the periphery of a disk I' upon the upper shaft X, said disk being preferably bolted to the outer side of an adjacent wheel B'. The circumference of the disk I' is not of uniform diameter; but it has a raised or cam part i' , which by engaging and pressing the arm G' outward against the pressure of the spring H' turns the shaft D' to depress the fingers C' and C', so that they will clamp the paper against the cross-bar F'. To admit of sufficient adjustment to enable the time of operation of the fingers to be accurately fixed, the disk I' has circular slots i'' concentric with the upper shaft X, through which pass the bolts securing it to the wheel B'. The disk can thus be adjusted rotatively to shift the position of the cam i' . In view of the fact that the finger-actuating cam is mounted on the upper feed-disk shaft it is desirable when a change of feed is necessary to secure the same by adjusting the disks on the lower shaft X, as thus readjustment of the finger-actuating disk is avoided. The feeding-disks are adjusted to begin the feeding of the paper the instant the cylinders begin to print. The paper in passing from the printing-cylinders to and beyond the feeding-disks is supported on light bars or strips K' and K'.

After passing beyond the feed-disks W and

W the paper is carried to cutting mechanisms, by which it is divided both longitudinally and transversely to form separate sheets. Its division longitudinally is effected by pairs of circular knives L' and L' , there being a number of pairs agreeing with the number of longitudinal cuts to be made and the two knives of a pair being respectively adjustably mounted on parallel shafts M' and M' , placed one above the other and geared together by intermeshing wheels N' and N' . The gear N' on the upper shaft meshes with an idler O' , that in turn is in mesh with a gear P' upon a shaft Q' , mounted crosswise of the machine and having on it a gear R' . The latter meshes with a wheel S' , that by means of a pinion T' is geared to a wheel U' on the lower feed-shaft X , so that from the latter power is transmitted to the shaft Q to revolve the circular knives. The paper is cut transversely by two knives V' and W' , having straight cutting edges, the former being a fixed knife and the latter carried by a head or bar X' , which is hung at opposite ends to eccentrics or crank-disks Y' and Y' and by the revolution of the latter given an oscillating motion that causes the knife W' to travel past the fixed knife V' . The eccentrics Y' and Y' are respectively mounted on parallel shafts Z' and Z' , each of which has a bevel-gear z , that meshes with a like gear q' upon the shaft Q' . Thus both cutting devices receive their motion from the shaft Q' . Placed between the longitudinally-cutting devices and the transversely-cutting devices is a paper-feeding roller A^2 , over which the paper passes, being pressed against the periphery by a series of rollers B^2 and B^2 , journaled each at the lower end of an arm C^2 , hung from a cross-bar D^2 . Said roller A^2 is geared to and receives motion from the lower knife-shaft M' , and preferably the gearing is such that said roller is driven at a speed which moves the paper slightly faster than the feeding-disks W and W , so as to prevent the formation of any slack in the paper.

All of the parts of the cutting mechanisms are mounted upon a frame E^2 , composed of parallel side and cross bars and slidingly mounted on the main-frame sides B and B , so as to permit of the bodily shifting of said mechanisms to and from the printing mechanism to enable the paper to be cut according to the size of the matter printed. To effect such shifting of the cutting mechanisms, at the bottom of each side of the frame E^2 is a rack-bar e , with which meshes a pinion f' on a shaft F^2 , which by means of a crank f' may be revolved to cause the shifting of said frame and its attached parts. In view of the shiftability of the latter, which results in changing the distance between the shafts X and Q' , which are geared together, provision is made for adapting the gearing to the changed relative positions of said shafts by mounting the gear-wheel S' on a stud-shaft on an arm

G^2 , which is pivoted concentric with the pinion T' . A clamp consisting of a bolt H^2 and a nut I^2 , coöperating with an arm K^2 , having a slot curved concentric with the pinion T' , provides means for holding the gear-wheel S' in a position properly in mesh with the wheel R' on the shaft Q' , whatever be the position to which the latter may be moved in adjusting the frame E^2 relative to the printing mechanism. The sheets as cut off by the knives V' and W' fall upon a suitable table L^2 .

It will be seen that our press is adjustable as to the size of the matter to be printed, the quantity of paper fed after being printed, and as to the cutting mechanisms, so that by the one press there can be range of size in the sheets delivered from it both in respect to the width and length of the sheets.

Although we have shown and described a rotary press as embodying our invention, it is to be understood that the scope of the invention is not restricted to a press of this type, but that it extends to other types of press.

Having thus described our invention, what we claim is—

1. In a printing-press, the combination of printing mechanism, intermittently-acting paper-feed mechanism including a shaft having a paper-engaging member thereon, a periodically-acting paper-stopping device, means on said shaft whereby said device is caused to act upon the paper when the feed by the feeding mechanism ceases, and a paper-cutting mechanism, substantially as described.

2. In a printing-press, the combination of a rotary printing mechanism, intermittently-acting paper-feeding mechanism including a shaft having a paper-engaging member thereon, a periodically-acting paper-stopping device, means on said shaft whereby said device is caused to act upon the paper when the feed by said mechanism ceases, and a paper-cutting mechanism, substantially as described.

3. In a printing-press, the combination of a rotary printing mechanism, intermittently-acting paper-feeding mechanism including a pair of shafts having rotary feed members, a paper-stopping device including vibratory clamping-fingers, and means on one of said shafts for periodically moving said fingers against and from the paper during the rotation of said members, substantially as described.

4. In a printing-press, the combination of printing mechanism including a shaft having a feed member thereon, intermittently-acting feeding mechanism, a paper-stopping device located between the printing mechanism and the feeding mechanism, and movable to and from the path of the paper, means on said shaft whereby said device is caused to act upon the paper when the feed by the feeding mechanism ceases, and a paper-cutting mechanism, substantially as described.

5. In a printing-press, the combination of

printing mechanism, intermittently - acting feed-wheels, shafts therefor, vibratory paper-clamping fingers, means on one of said shafts to render said fingers active and idle at pre-
5 determined intervals during the rotation of the said feed-wheels, and a cutting mechanism, substantially as described.

6. In a printing-press, the combination of printing mechanism, intermittently - acting
10 feed-wheels, a shaft therefor, a cam on the shaft, a rock-shaft having paper-clamping fingers, and an arm on said shaft to coact with the cam, substantially as and for the purpose described.

15 7. In a printing-press, the combination of printing mechanism, intermittently - acting, adjustable feeding mechanism including a shaft having a feed member thereon, a paper-stopping device, and means on said shaft
20 whereby the said device is caused to act upon the paper when its feed by the feeding mechanism ceases, and paper-cutting mechanism shiftable toward and from the printing mechanism, substantially as described.

25 8. In a printing-press, the combination of printing mechanism for printing on a web, intermittently-acting adjustable feeding mechanism including a shaft having a feed member thereon, a paper-stopping device, means
30 on said shaft whereby the said device is caused to act upon the paper when its feed by the feeding mechanism ceases, rotary cutters for cutting the web longitudinally, a reciprocating knife for cutting it transversely, feed-
35 rolls between the rotary cutters and the knife,

and a frame for said cutters, knife and rolls, that is movable toward and from the printing mechanism, substantially as described.

9. In a printing-press, the combination of printing mechanism for printing on a web, 40 web-feeding mechanism, cutting mechanism, and web-feeding mechanism associated with the latter that moves the web faster than the other mechanism, together with a periodically - acting web-stopping device under the 45 control of the second-named feeding mechanism, substantially as described.

10. In a printing-press, the combination of feeding-wheels, shafts one above the other on which they are respectively mounted and disks 50 on the shafts that are in peripheral contact whereby the upper shaft is supported from sagging, substantially as and for the purpose described.

11. In a printing-press, the combination of 55 feeding-wheels, horizontal shafts on which they are respectively mounted, placed one above the other, disks on the shafts that are in peripheral contact whereby the upper shaft is supported from sagging and a support for 60 the lower shaft intermediate its ends, substantially as and for the purpose described.

In testimony that we claim the foregoing we have hereunto set our hands this 6th day of November, 1899.

CHARLES HENRY PALMER.

JOHN W. DENMEAD.

Witnesses:

TOM A. PALMER,

B. C. ROSS.